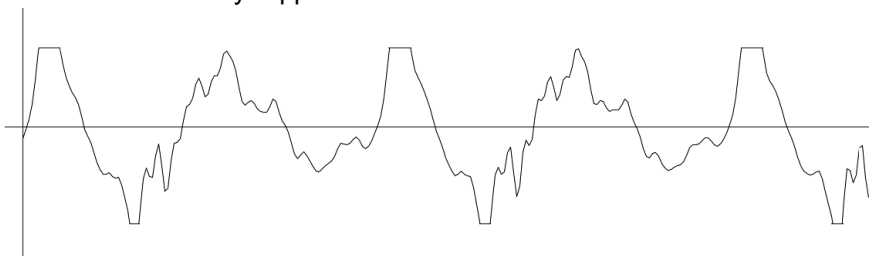
Question Number	Question	Mark
1(a)	Give **one** reason why a pop shield was used when recording this vocal.	**1**
	Acceptable Answers	
	Prevent plosives / Ps and Bs (1). [Not 'pop' because given in the question] Regulate the position of the vocalist (1)	

Question Number	Question	Mark
1(b)	Give **one** reason why a cardioid microphone was used when recording this vocal.	**1**
	Acceptable Answers	
	Reduce room ambience (1). Proximity effect (1). Reduce background noise (1). Not 'headphone spill' or 'spill'.	

Question Number	Question	Mark
1(c)	A valve pre-amp was used when recording this vocal. Explain why a recording engineer would decide to use valve technology.	**2**
	Acceptable Answers	
	Warm / vintage (1) Soft clipping (1) More harmonics (1) Non-linear response (1) Higher perceived loudness (1)	

Question Number	Question	Mark
1(d)	Notate the rhythm of the filtered vocal part in bars 22-25.	**4**
	Acceptable Answers	
	1 mark for each correct bar. 	

Question Number	Question	Mark
1(e)(i)	Identify the effect added to the vocal in bars 20-21.	**1**
	Acceptable Answers	
	Distortion / clipping / fuzz / overdrive (1) Allow 'bitcrusher'/reduced bit depth. Apply SONC.	

Question Number	Question	Mark
1(e)(ii)	The graph below shows the original vocal waveform. On top of the original waveform, draw the change in the waveform shape once the effect in 1(e)(i) has been added.	**2**
	Acceptable Answers	
	0 marks for a square wave or similar wrong waveform 1 mark partially clipped waveform, e.g. not all peaks clipped, or some clipped peaks higher than others, out of phase/doesn't follow the original waveform closely 2 marks for correctly clipped waveform  Allow bit-crushed waveform if bitcrusher is given for 1e(i)	

Question Number	Question			Mark
1(f)	Compression has been applied to the vocal. The table below shows the settings that were used. Explain why these settings were chosen.			**4**
	Acceptable Answers			
	Parameter	Setting	Explanation	
	Ratio	15:1	High ratio / 15dB in, 1dB out / heavy compression (1) Reduce dynamic range / evens out the volumes / avoid quiet sections being masked / avoid loud sections jumping out of the mix (1) To match the narrow dynamic range of the sequenced parts / suits (electronic music) style/genre (1)	
	Gain make-up	+15dB	High gain make-up (1) because of high ratio / 15dB in, 1dB out / heavy compression (1) to compensate for loss of volume (1)	

Question Number	Question	Mark
2(a)	Listen to the bass part that you have imported. Identify the pitch bend range used on the bass on the last note of bar 5.	**1**
	Acceptable Answers	
	1 octave 12 (semitones)	

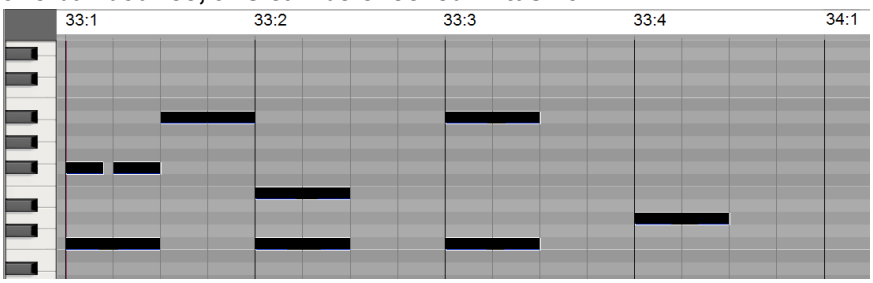
Question Number	Question	Mark
2(b)	Bars 6-9 of the bass part are notated below. Fill in the four missing pitches (each marked by an asterisk).	**4**
	Acceptable Answers	
	 Accept enharmonic equivalents. Assess pitch only. Sharps/flats after the notes are not credited.	

Question Number	Question	Mark
2(c)	Compare bar 7 with bar 11. Describe how synthesis is used in bar 11 to change the timbre on beat 3.	**4**
	Acceptable Answers	
	Low pass(1) filter (1) / LPF (2) Attack (time) (1) increased / longer / slower (1) of cutoff frequency (1) envelope/ADSR (1). OR Cutoff frequency (1) increases throughout the note (1) using automation (1). Allow 'reversed' (1).	

Question Number	Question	Mark
2(d)	Describe how the envelope is used to gradually change the timbre throughout bars 26-29.	**2**
	Acceptable Answers	
	Release (1) increased / longer / slower (1) Allow: Decay (1) increased / longer / slower (1) Sustain increased / higher (1), not 'longer' Apply SONC if change in attack is mentioned.	

Question Number	Question	Mark
2(e)	Identify the synthesiser parameter which suddenly increases to maximum in bar 30.	**1**
	Acceptable Answers	
	resonance / Q / peak (1)	

Question Number	Question	Mark
2(f)	Explain why the envelope settings are causing clicks in bar 18.	**2**
	Acceptable Answers	
	Attack too short / release too short (1) [don't apply SONC] (Amplitude) envelope is switched off so the sound is triggered by the gate (1) [don't credit any reference to noise gate] Cutting off the waveform mid cycle / suddenly reverts to 0 (1)	

Question Number	Question	Mark
3(a)	Using the drum sounds from “drums.wav”, complete the drum part in bar 33 using the rhythm shown in the grid editor below.	**8**
	Listen to 1’01”, the fourth bar after the breakdown. **Samples must be taken from ‘drums.wav’:** **Rhythm in beats 1-3** Kick and snare correct (1) Closed and open hats correct (1) [ignore hi-hats masked by the snare] **Sample management for kick, snare and hats in beats 1-3** Tight rhythm (1) [if rhythm is incorrect then =0] No clicks (1) Samples are not cut shorter than J, no audible join, no change in volume and no change in pitch (1) [If only one bar is bounced, then=0.] **Reverse snare on 33:4** Reverse snare is present (1) There are no other reverse snares in the track (1) No reverse kick drum present, no additional drum hits, no clicks, sample is complete, no change in volume and no change in pitch (1) **Award 1 mark if candidate completed the correct rhythm for beats 1-4 in all parts using MIDI drum kit / other samples.** **Max 1 if the drum pattern has been copied from a whole bar from elsewhere in the song.** **If drums are not soloed / metronome left on, then assess what can be heard clearly to max 4.** **If there is a mixture of MIDI and audio, or if either the kick, snare or hi-hats is missing, then divide total mark by 2.** **If the drum fill is in the wrong place in the song then max 1. If it’s a one bar bounce, this can be checked in task 3.** 	

Question Number	Question	Mark
3(b)(i)	Identify the lowest pitch bend value in bar 9.	**1**
	Acceptable Answers	
	-8192 -64 0	

Question Number	Question	Mark
3(b) (ii)	Identify the position, in bars:beats:semiquavers:ticks, of when the pitch bend resets to centre.	**1**
	Acceptable Answers	
	10:1:1:1 10:1:1:0 Allow 10:1:0	

<table>
<tr><th>Question Number</th><th>Question</th><th>Mark</th></tr>
<tr><td>3(c)</td><td>Create a synth sound that matches the timbre “chords example.wav”.
(i) Ensure that the octave matches the example.
(1)
(ii) Use a square wave with no effects.
(1)
(iii) Ensure the pitch bend range matches the example.
(1)
(iv) Copy the amplitude envelope.
(1)
(v) Copy the filter envelope.
(3)
Acceptable Answers
“chords example” was 0:15-0:17 (or an equivalent location for candidate responses with more/less silence at the start of the CD track).
“Chords” timbre
(i) Correct octave and pitches throughout with polyphony (1)
(ii) Wave (1):
Square wave timbre. Allow saw or pulse.
Award 0 if any FX are added.
(iii) Pitch bend range is 2 octaves (1)
Check at 0:16
(iv) Amplitude & pitch envelope (1):
D=max, S=max, R=0 (release less than V) [ignore attack]
AND
No portamento
(v)
A moving LPF is clearly audible throughout, or a static cutoff more muffled than J. (1)
Slow attack (allow slow amplitude attack) (1)

Sounds similar to ’task 2.wav’. Resonant LPF with slow attack giving a wah attack on every note. (3)

Max. 3

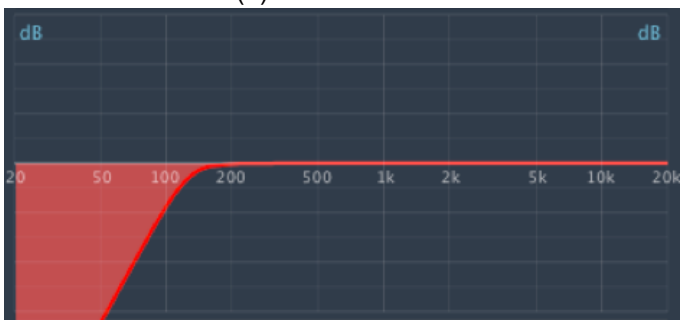
If chords are not soloed, has effects, or the metronome is switched on, assess what can be heard clearly.

If instrument is not a synthesiser (e.g. bass guitar/piano) then award (i) and (iii) only.

If there is no evidence of the chords timbre outside of bar 9 then award 0.</td><td>7</td></tr>
</table>

Question Number	Question	Mark
4(a)	Explain how a recording engineer would edit and mix takes for a natural sounding lead vocal. Explain how editing takes would have been different when using analogue tape in the 1980s.	**16**
	Acceptable Answers	
	Max 3 for any processes in bold. *In this mark scheme, italics mean that the mark should not be credited multiple times.* <u>Underlined technical terms must be spelt correctly</u> **Comping & editing** ~ is the process of choosing the best fragments from many takes to form a single take (1). Edit points should normally be just before an attack / beginning of a word / in a silent gap (1). Cross fading / fade tool (1) with times 10-100ms (1) or zero-crossing points (1) to prevent clicks (1). Appropriate fade shape (1) to prevent drop-outs (1). If edit point is in the middle of a phrase or word it may sound unnatural (1). Background noise should be edited out (1). Edit out breaths/vocal clicks / leave breaths in as part of the performance (1). Fade/reduce volume of plosives/sibilance (1). Matching volume/EQ of different takes (1). Repairing mistakes using material from an alternative section of the song, e.g. 'patching' a chorus (1). **Autotune / pitch correction / flex pitch / melodyne (1)** Slow response time (1) to stop vocal becoming robot-like/unnatural (1). Leave embellishments untuned (1). Use a scale to remove notes not sung / draw or drag pitches on graphical editor (1). Manual pitch correction for single notes/isolated problems (1). **Flextime / audio quantise / move phrases to change the timing (1)** Particularly important if there are backing vocals (1). **<u>EQ</u> (1)** <u>HPF</u> (1) to reduce rumble (1), to reduce plosives (1). <u>Presence peak</u> (1) 3-6kHz (1) upper-mids (1) helps vocals cut through a mix (1). High shelving EQ boost / high frequency boost (1) frequencies more than 5kHz-9kHz (1) brings vocal forward in the mix (1) adds a breathy quality / air (1). Lower mids reduced (1) 200-500Hz (1) to make space for other instruments in lower mid range (1).	

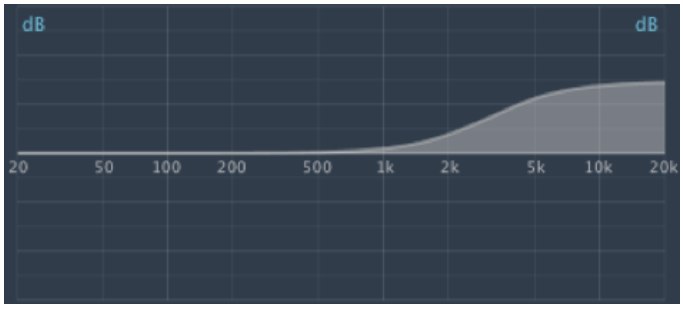
	<u>Gate</u> (1) ~ to reduce background noise (1). If (threshold too high) some of the words could be cut out (1). Range / gain reduction not on maximum (1). **<u>Compression</u> (1)** High <u>threshold</u> (1) low <u>ratio</u> (1) <u>RMS</u> (1) long/medium release (1) soft knee (1). Small amount of gain reduction (1). **Level & pan** Lead vocal should be loudest to sit on top of the mix (1). Panned centre (1). **<u>De-esser</u> (1)** Reduce sibilance / s (1) **<u>Reverb</u> (1)** 1-2s reverb time (1). Hall / room / plate / stereo (1) *low send/wet amount (1)* **<u>Delay</u> (1)** 20-100ms (1) *low send/wet amount (1)* to thicken the vocal (1). Add some stereo width (1). **<u>Chorus</u> (1)** Thickens vocal (1). **1980s take editing/ comping** Lack of visual display (1) Drop-ins / punch-in (1). Recorded on separate tracks / fewer tracks for takes (1). Different sections of the vocal are soloed/muted (1) <u>routed/bounced</u> (to a new track) (1), freeing up tracks on the tape (1). Cueing the tape takes longer (1). Analogue bouncing reduces sound quality (1) because adds noise (1) reduces high frequencies (1). *No credit for cutting and splicing tape.*	

Question Number	Question	Mark
4(b)	Figure 1 shows a channel on an analogue mixing desk. Many of the controls are similar to those on a digital audio workstation track. Explain the function of the controls and specifications that can be seen in the picture. Give **one** practical use for each control.	**16**
	Acceptable Answers	
	In this mark scheme, italics mean that the mark should not be credited multiple times. Underlined technical terms must be spelt correctly **Sens** *Gain* (1). Not 'volume'. Pre-amp (1) *U = unity gain (1)* Set to achieve a good signal to noise ratio (1). Too high will be distorted (1). Too low will introduce noise (1) Credit reference to different impedance/levels of sources (1). **For each EQ/filter graph**: Correct shape (1) Labelled axes should be credited for one graph only. x-axis: Hz/Frequency (1). Appropriate numbers ranging from 20 to 20k (1) y-axis: dB/volume/gain / appropriate numbers: e.g. +-15 (1). **100Hz** HPF / High pass filter / low cut filter / cuts low frequencies (1). Credit any valid example of use: e.g. reduce plosives / reduce proximity effect / rumble filter (1).  	

EQ

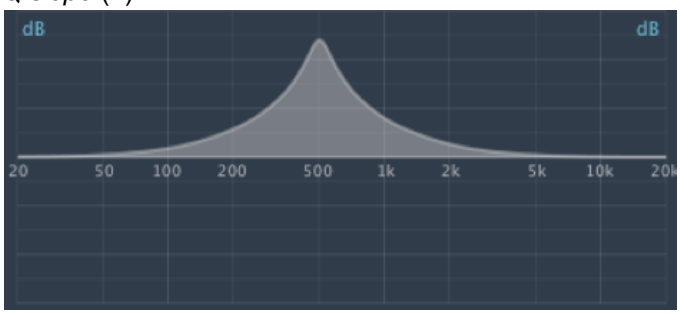
Equalisation (1) Boosts or cuts (different frequencies) (1)
Gain (1).

High frequencies (1)
(High) *shelving EQ* (1). *Fixed cutoff/frequency/Q/slope (1).*



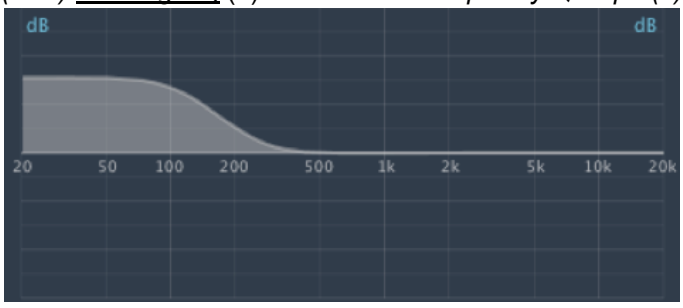
Credit any valid example of use: e.g. bring something (vocal / reverb / acoustic guitar) forward in the mix / clarity on overheads / correct lack of HF response from dynamic mics / gentle high-shelf boost for mastering / loudness curve / increases perceived loudness (1)

Mid (no mark available)
Sweepable/selectable (centre) frequency (1). Bell / peak (1). *Fixed Q/slope* (1).



Credit any valid example of use: e.g. boost at around 2kHz to bring out the beater of a kick drum / mid-band scoop on a distorted electric guitar / reduce LM to make mix less muddy / reduce sibilance (1)

Low frequencies (1) [don't credit if already credited 'high frequencies']
(Low) shelving EQ (1). *Fixed cutoff/frequency/Q/slope (1).*



Credit any valid example of use: e.g. more bassy kick drum / more bassy bass guitar / loudness curve / increases perceived loudness (1)
Accept answers for HPF if not already credited and specific reference to attenuating LF.

	Sends Effects / foldback (1) [general not linked to pre/post] The signal is sent to separate hardware/aux track/bus track / The wet signal will return to a separate channel (1). Bus/group several tracks together (1) *Pre-fade* (1). *The volume of the send is not affected by the fader /before the fader in the signal path/independent of fader* (1). Credit any valid example of use: e.g. monitor mixes / fading the dry signal of the track leaving the reverb behind making parts move backwards and forwards in the mix (1). *Post-fade* (1). *The volume of the send is affected by the fader* (1). Credit any valid example of use: e.g. adding effects like reverb, chorus, delay etc (1). **Pan** Stereo field / left and right (1) by adjusting the amplitude of the two sides of a stereo output (1). Credit any valid example of use: e.g. pan guitar to the left to separate from the lead vocal in the centre / opposite pan a stereo pair of microphones / opposite pan double tracked guitars / pan instruments to resemble where they would appear on a stage (1). **On** Can be used to mute the channel (1), lower noise (1), prevent feedback (1). Routes/assigns (1) the signal to main outputs/L-R (1). **Fader (1)** Volume output (1). Credit any valid example of use: e.g. to balance the tracks / riding the faders to make a fade out (1). Logarithmic scale (1) Greatest sensitivity to movement around 0 (1) *0 = unity gain (1)* **PFL** Pre-fade listen (1). Solo (1). *The volume of the PFL is not affected by the fader /before the fader in the signal path/independent of fader (1). Unity gain (1).* Credit any valid example of use: e.g. check for problems with this track (1).	

Question Number	Question	Mark
5(a)	Listen to the effect on the **vocals** in **bars 2-3**. Recreate that effect in **bars 4-5**.	**3**
	Acceptable Answers	
	Listen to vocals at 0:06 (second phrase in intro). Mono delay with crotchet feel delay time (1) Send amount (wet<=dry) and feedback≈50% (1) HPF (1) Max 2 if there is delay added /a volume change on the example delay in bars 2-3 that is >J Max 1 if: Other parts of the vocals are affected by the delay OR Not all of the “Hey my” phrase is delayed. OR Vocals have delay but wrong effect added on any track except some tasteful reverb. Award 0 if copy and pasted the first phrase delay	

<table>
<tr><th>Question Number</th><th>Question</th><th>Mark</th></tr>
<tr><td>5(b)</td><td>Apply automated panning to the vocals.
Only bars 6-12 should be affected; all other bars should panned to the centre.
Both “Hey my” phrases should be panned hard left.
Both “Wake up” phrases should be panned hard right.
Acceptable Answers
Listen to the vocal between 0:09-0:21 (verse 1).<table><tr><th></th><th>Management & control of the vocal panning automation</th></tr><tr><td>3</td><td>L – R – L – R
Vocal pans hard left then hard right as directed.</td></tr><tr><td>2</td><td>R – L – R – L
OR
C – R – C - R
OR
L – C – L – C
OR
L – R – C – C
OR
R – L – C – C etc
OR
Soft panning
OR
Panning automation can be heard moving on vocals. Ignore moving reverb or delay tails.</td></tr><tr><td>1</td><td>Erratic panning
AND/OR
Vocals panned in a single position other than centre.
AND/OR
The vocals do not reset to centre.
AND/OR
Vocals panned but other parts panned noticeably off-centre</td></tr><tr><td>0</td><td>There is no audible panning automation on the vocals.
OR
No mix present on CD.</td></tr></table></td><td>3</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Question</th><th>Mark</th></tr>
<tr><td>5(c)</td><td>Apply an automated filter to the vocals.
Only bars 26-29 should be affected.
Use the filter type as heard in bars 22-25.
At the beginning of bar 26, the cutoff frequency should be set the same as heard in bar 25.
Gradually increase the cutoff frequency so that the effect continues to build until the end of bar 29.
Acceptable Answers
Listen to vocals from 0:48-0:56 (middle section).<table><tr><th></th><th>Management & control of vocal filtering</th></tr><tr><td>3</td><td>The cutoff frequency of the low pass filter smoothly rises throughout the whole middle section. The cutoff in bar 26 matches bar 25.</td></tr><tr><td>2</td><td>The cutoff frequency of the low pass filter smoothly rises throughout the whole middle section
BUT
There is an audible join between sections more obvious than G.
OR
The cutoff in bar 26 does not match bar 25 / higher than G.
OR
No sense of crescendo in second half of intro / cut off rises too quickly / not the full frequency range used</td></tr><tr><td>1</td><td>A variable low pass filter is used to create some sense of crescendo but:
OR
A jerky or static low pass filter or low-shelving EQ is used that creates a noticeable contrast in the middle section.
OR
Other parts of the vocals are affected by the filtering.
OR
Vocals correctly filtered but other instruments have noticeable filtering / EQ</td></tr><tr><td>0</td><td>There is no clearly audible low pass filtering on the vocals in bars 26-29.
OR
Wrong filter type
OR
No mix present on CD.</td></tr></table></td><td>3</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Question</th><th>Mark</th></tr>
<tr><td>5(d)</td><td>Gate the bass.
Only bars 26-29 should be affected.
The drums track should trigger the side chain of the gate so that the bass plays in time with the hi-hats.
Acceptable Answers
Listen to 0:48-0:56.<table><tr><td></td><td>Management & control of bass gating
Rhythm should be:
Bars 26-27 are crotchets
Bars 28-29 are quavers</td></tr><tr><td>3</td><td>Keyed gate:
Bass only plays simultaneously with the hi-hats.</td></tr><tr><td>2</td><td>Keyed gate:
The rhythm is correct, but only the attack of the bass can be heard because the threshold is too high
OR
Release too long / fades
OR
Clicks because attack and release too short
OR
Audible join when gate is bypassed at 25-26 or 29-30
OR
Chattering gate</td></tr><tr><td>1</td><td>Keyed gate:
BUT
Other bars are affected, e.g. bass pitch bend at 0:07 is cut out
OR
Incorrect rhythm</td></tr><tr><td>0</td><td>There is no audible evidence of keyed gating on the bass.
No mix present on CD.</td></tr></table></td><td>3</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Question</th><th>Mark</th></tr>
<tr><td>5(e)</td><td>Balance the mix.
Ensure that all of the tracks can be heard clearly.
Acceptable Answers<table>
<tr><td></td><td>Balance and blend
On CD ROM:
Vocal quietest
Drums moderate
Bass loudest</td></tr>
<tr><td>3</td><td>Balanced and blended across all parts of the mix. Vocals sit on top of mix. Drums >=G.</td></tr>
<tr><td>2</td><td>Most tracks are balanced with some masking. A few misjudgements, e.g. chords louder than the vocal; or drums quieter than chords/bass; or vocals too loud, similar to L</td></tr>
<tr><td>1</td><td>Balanced so that one track is barely audible, or one track is too dominant. E.g. vocal <= cand Z, bass >= cand Z
OR
Additional tracks.
OR
Volumes of tracks are erratic

IGNORE previously assessed work:
e.g. inaudible vocal phrases due to incorrect filter cut-off in Q5c</td></tr>
<tr><td>0</td><td>No mix on CD
OR
One track missing</td></tr>
</table></td><td>3</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Question</th><th>Mark</th></tr>
<tr><td>5(f)</td><td>Produce a final stereo mix.
Ensure that the mix output is at as high a level as possible.
It should be free from distortion.
Do not limit or compress the mix output.
Ensure that the beginning and the end of the music are not cut off.
Ensure that silences at the beginning and end do not exceed one second.
Acceptable Answers<table><tr><td></td><td>Presentation of mix</td></tr><tr><td>3</td><td>Beginning and end of mix does not cut out music or tails.
The beginning and end have less than 1 second of silence.
The mix output is near normalised with no distortion.</td></tr><tr><td>2</td><td>Beginning and end of mix do not cut out. The beginning and/or end have a silence of greater than one second.
OR
The mix output is too low OR is compressed OR there is some slight distortion OR is louder than “MS task 3”.
OR
Cut delay/reverb/bass/chords tail</td></tr><tr><td>1</td><td>Obviously chopped start or ending (not including tails).
OR
The mix output is unacceptably low or too high (distorted) OR excessive use of mix compression causes pumping
OR
Metronome has not been turned off.
OR
Any part is noticeably out of sync / out of tune / missing

IGNORE previously assessed work:
e.g. drum rhythm;
inaudible vocal phrases due to incorrect filter cut-off in Q5c</td></tr><tr><td>0</td><td>No mix present on CD.</td></tr><tr><td></td><td></td></tr></table></td><td>3</td></tr>
</table>